Newton’s 2nd & 3rd Laws of Motion (ch 4 & 5)

Remember:

Factors affecting motion

* **Force**; When the forces are balanced there is no change in motion. Σ=0 (net force is all forces acting = 0)
  + In inertia (1st law) an object will not change its motion (tendency to resist change) unless acted on by an outside force.
  + When force is applied acceleration occurs. Force ͠ acceleration (slows down, speeds up, change direction)
* **Friction**- always in the direction opposing motion
  + - Caused by
      1. Surface contact irregularities- must either “jump over” or rub the atoms off
      2. Material
      3. Forces pushing together
    - Friction types
      1. Static- needed to overcome to start motion

Think- **Which has more traction on ice**, sliding or rolling?

* + - 1. Sliding- Sliding has NO control b/c or reduction in friction;
      2. Rolling- Rolling is static friction (has larger effect)
    - If there is no motion, there is no friction
    - Friction is **NOT affected by speed** or **area of contact;** (if object is moving) ; # of tires or size do not change amount of friction: If fewer or smaller tires, the weight (force) is concentrated;
    - Stopping distance when brakes are applied is not affected by the number of tires
    - Friction also occurs in fluids: Speed DOES matter in fluids; air resistance (drag)
    - Terminal Velocity- when gravitational acceleration = drag (air resistance) & you are no longer speeding up as you fall.
* Mass & Weight
  + F = ma; F- force (Newton’s); M = mass (kg); a = Acceleration (m/s2)
  + Also seen as W = mg; **Weight** (Newton’s; M mass (kg); g –(acceleration of gravity)
  + Mass- measure of inertia; quantity of matter; directly proportional;
  + Mass α inertia; mass is directly proportional to mass;
  + Mass is a measure of inertia
  + Mass is fundamental unit & doesn’t change due to placement; weight is affected by other masses (pull of gravity)
  + Weight decreases further from the center of the mass, or a reduction in the quantitiy of mass